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# Alcohol

James G. Dudley

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ALCOHOL:  
ITS COMBINATIONS, ADULTERATIONS  
AND  
PHYSICAL EFFECTS.

BY  
COL. J. G. DUDLEY.

"The laws of health are the laws of God, and as binding on man as the Decalogue."—WILLARD PARKER, M.D., *Ex-President Academy of Medicine.*

"Among the evil institutions that threaten the integrity and safety of a state, the liquor traffic stands preëminent."—HON. JOHN BRIGHT.

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## INTRODUCTION.

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THE following pages have been compiled from the writings and lectures of the most celebrated chemists, physicians, and physiologists of the present age, and due credit has been given to them in the body of the work.

The writer believes that the true way to promote the Temperance Cause is, to kindly and truthfully teach the people the true nature of alcoholic beverages, and to expose the system of adulterations and frauds that are practised to such an alarming extent by the dealers in them.

The Hon. John Bright has said, "Were men but properly informed on this question, and were our legislators not blinded by custom, appetite, and interest, we should not need to ask them for a Permissive, Prohibitory Liquor Law, for, without delay, by an im-

perial enactment, the liquor traffic would be annihilated at a stroke."

With the hope that this treatise may help to check the swelling tide of intemperance that threatens to overwhelm our country, it is respectfully submitted to all classes of society.

J. G. D.

NEW YORK CITY, 1874.

# ALCOHOL:

ITS COMBINATIONS, ADULTERATIONS, AND PHYSICAL EFFECTS.

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“If alcohol were unknown, half the sin, and a large part of the poverty and unhappiness of this world would disappear.”

Professor EDMUND A. PARKES, M.D., F.R.S.

No student of history can doubt that our country is destined to take a controlling part in the affairs of this world. In the war for Independence and the one for the preservation of the Union, our success has been brilliant and decisive, and there appears to be nothing so likely to check or endanger our future progress as the wide-spread and inveterate habit of using alcoholic beverages. The teachings of history prove that the enemies of a nation most to be dreaded are those harbored within its own borders.

One of the most learned physiologists and eminent surgeons of our time, declares, “that drunkenness

is one of the mightiest evils God ever tolerated on this earth; that cholera and yellow fever are harmless compared with it; and that thirty-three and a third per cent. of all the deaths in the City of New York are the direct, or indirect, result of the use of alcohol."

One of the ablest thinkers and writers of England, writes, "it is the curse of that country; a curse so great that it eclipses every other calamity under which England suffers, and it is impossible," he says, "to exaggerate the evils of intemperance."

Careful study and observation have convinced me that these statements are the truth, and I have felt it to be my duty to do all that I possibly can to instruct, not only the young, but all classes of society, concerning the true nature of alcoholic beverages, and the danger we are in from their continued use—a danger so great that, if it is not arrested and put down, it is certain to end in national demoralization and ruin!

The use of fermented liquors has been known from the earliest times, and the custom prevailed in the time of our Saviour and his Apostles, but the man who attempts to draw arguments from the Scriptures to uphold the drinking customs of the present day is either reckless or ignorant. There is no sin denounced with greater force in the Bible, or in stronger terms, than the sin of drunkenness.

The "Text-book of Temperance" states, p. 119, "that about sixty texts of the 'authorized version' refer to wine (or what is supposed to be wine) with approbation, where the context shows or implies it to be a natural or unfermented product. Not more than fifty-two texts can be proved by the context to refer to intoxicating wine, and not one of these is connected with the Divine blessing. On the contrary, one-half of them describe it as an evil, a mocker, and a stupefier, or else prohibit it, either in general or special terms."

All of these discussions as to what was the nature of the wines used in Scripture times, or in the remote ages of antiquity, are alike unsatisfying and unprofitable. We know, both from sacred and profane history, that most of them were intoxicating. Where it is recommended in the Bible, it is generally as a medicine or a condiment, and its excessive or habitual use is always denounced.

From profane history we learn that the drunken habits of the people produced national degradation and ruin. Babylon was conquered not so much by the Medes and Persians as by drunkenness and revelry. Persia fell not so much by the energy and valor of the Greek army as by the drunkenness of her kings and people. Greece, in her turn, not so much by the prowess of the Roman arms as by her own discord and infamy. Rome fell not so much by the hordes of

Goths, Huns, and Vandals descending on her plains, and assaulting her cities, as by the careless ease and sottishness of her people. Wine and spoil took away the heart of that great empire, and unnerved its mighty arm.

We know these facts, and no one is ignorant of the baneful effects of the drinking customs of our time, and instead of perplexing ourselves with the questions as to whether the miraculous wine of Cana of Galilee, or that given by our Saviour to his disciples at the Last Supper, was fermented or unfermented, intoxicating or not intoxicating, let each person, individually, ask himself, when the liquor is before him, this question, *If I drink this what will it do to me?* and judging by what we know of its effect upon others, let the decision be; **I WILL NOT DRINK IT!** for its use involves so great a chance of incurring drunken habits that total abstinence is the wisest and safest course. •

I have carefully and conscientiously studied this subject for a long time, and have had the advantage of the discussions, experiments, and investigations of the most learned chemists, physicians, and physiologists of the present age, and I shall state plainly only what has been decided to be the truth by the careful scientific investigations of the ablest men in this country and in Europe.

“Alcohol is an Arabic word, and originally signified anything very fine, thin, much divided or separated

from the grosser portions of a substance. The word was first applied to an impalpable powder, but it is now applied to the principal quality found in intoxicating liquors, upon which their poisonous nature chiefly depends." \*

The art of distillation was discovered about the tenth century, by an Arabian alchemist, while searching for the philosopher's stone and the elixir of life, but it was not introduced into the medical practice of Europe until the thirteenth century, and was supposed at first to be a universal medicine that would preserve life, and prevent or cure all diseases ; and the extravagant praises lavished upon it by Arnoldus de Villa, and Raymond Lully, and afterwards by Theoricus, and other physicians of that age, were eagerly believed by all classes of society ; and those who feared the plague, or any other disease, eagerly sought the new ether, or liquor, for safety, restoration, or protection.

From this fatal error sprang the social custom of drinking it, and the daily use of its compounds ; and the habit of using these drinks became common all over Europe, and drunkenness, with increased misery and crime, was the result. Alcoholic liquors, and the errors with regard to their effects, were brought to this country by its first discoverers ; the teachings of

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\* Wetherbee's "Toxicology."

De Villa, Lully, Theoricus, and others of the thirteenth and fourteenth centuries, were accepted, with but few exceptions, by both learned and unlearned; and in the fashionable dwellings of the rich, as well as the humblest abodes of the poor, not to offer some kind of liquor to the friend, acquaintance, or stranger when he called, was considered an act of inhospitality.

It was believed to be nourishing, to create strength, and to be either some kind of food or to supply the place of food, and it was not until the great advance in chemical science in the present century that its true nature and poisonous effects were fully explained and demonstrated, and it is now settled by the concurrent opinion of the ablest toxicologists of our time that it is a poison—compound in its nature, belonging to the class of narcotico-acrid poisons.

It is also known that its effects upon man are different from those of any other poison, for it not only produces disease and death, like other poisons, but it changes the whole moral nature of man, and destroys all that civilization, education, and Christian instruction have done for his moral elevation and improvement. Its action upon the brain and nervous system appears to paralyze the will, lull conscience to repose, and stupefy the moral perceptions, and at the same time it arouses and lets loose all the savage and criminal proclivities of

man, and the most atrocious, revolting, and unnatural crimes are the common result.

As its effects are rapidly diffused through the system, it acts as a diffusive stimulant when given in medicinal doses ; but if taken in larger doses, it is an irritant, and afterwards a narcotic. In treating of this part of this subject, it is well to understand the difference between an irritant and a stimulant. A stimulant increases the use of given force ; it makes none, nor adds to power. An irritant may cause the undue expenditure of force like a stimulant, but it begins an organic lesion (*i. e.*, a derangement or disorder). As many of the symptoms of the diseases produced by the use of alcoholic drinks are gradual in coming on, it is cumulative in its effects.

“The distilled product of fermented liquors forms the ardent spirit of commerce. When obtained from the fermented juice of grapes or other fruits, it is called brandy, which signifies burnt wine ; from fermented molasses or sugar, rum, from the last syllable of *saccharum*, the Latin of sugar ; from corn, rye, wheat, barley, oats, potatoes, etc., whisky, originally meaning water, and also more appropriately called in Celtic language, *Buil-Caeun*, meaning *madness in the head* ; from rye, barley, and other grains, rectified from turpentine and juniper, gin ; from rice, palm juice, etc., arrack, an East Indian name.

"These liquors contain, in their first distillation, from 50 to 60 per cent. of alcohol, some of them with fusil oil, and all with some acids and other impurities. When redistilled or rectified, it contains about 85 per cent. of alcohol, which is the common alcohol of commerce. If redistilled the third time, it is so nearly free from impurities as to be called pure spirits, containing about 90 per cent. of alcohol."\* Absolutely pure alcohol cannot be obtained without careful, skillful manipulation, and is so volatile that it cannot be kept except in an air-tight vessel, and then with great difficulty.

The nature of alcohol has been carefully studied by the most eminent chemists and physicians, in order to determine its true character, and to learn its influence on the animal economy.

The first question to be asked is, What is alcohol? Is it food? It has been regarded as a kind of food by some chemists and physicians, but their opinions have been theoretical, and not borne out by facts. It was claimed as a kind of respiratory food, and that its use was to develop animal heat, consequently eliminating more carbonic acid. This conclusion is not sustained by observation and experiment.

Food is that which repairs some waste of the system. Now, in the human system there are water, fat, starch,

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\* Wetherbee's "Toxicology."

sugar, iron, sulphur, phosphorus, potassium, chlorine, etc., etc., etc., but no alcohol is found. It has no analogue in the system; hence there is nothing it can repair, and it cannot be ranked as food.

Is alcohol a poison? The best chemists and toxicologists all agree that it is. It answers to all the description of a poison. It possesses an inherent deleterious property which, when introduced into the system in sufficient quantity, destroys life, and it has its place with arsenic, strychnine, prussic acid, etc. Like these, it is to be employed as a medicine, and has its true position in works on *materia medica*. It is therefore both a poison and a medicine. In the last capacity, it has, like opium or arsenic, its definite characteristics; and in some cases as a medicine it is indispensable, as it is also in some of the arts and in chemistry; but it has no place at the table or as a beverage, either in distilled or fermented liquors.

Professor Christisson (p. 22, "Treatise on Poisons") states two general laws in regard to the influence of the chemical combination of poison. "One is, that poisons which only act locally have their action much impaired or even neutralized by their chemical combinations. Sulphuric acid and muriatic acid on the one hand, and the two fixed alkalis on the other, possess a violent local action; but if they are united, so as to form sulphates or muriates, they become merely gentle laxatives.

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*But the case is altered if either of the combining poisons act by entering the blood. For the second general law is, that the action of poisons which operate by entering the blood, although it may be somewhat lessened, cannot be destroyed or altered in their chemical combinations."*

Now, if alcohol is a poison, and acts by entering the blood, and cannot be destroyed or altered in its chemical combinations, it is impossible that it can act as food. When used at all, it should be under the advice of a competent physician.

Toxicologists divide poisons into three classes—irritants, narcotics, and narcotico-irritants. Alcohol, as I said before, belongs to the latter class. In its effects upon the living system in larger doses than is required for medicinal purposes, it acts at first as an irritant, and afterwards, when it has entered the circulation, it becomes narcotic. Were alcohol a stimulant or an irritant only, a man would as soon poison himself with arsenic or aquafortis. The narcotic element is the syren that leads him on to ruin and to death.

There are appetites implanted in the system, and when wisely managed, they help to keep the system in health. They express themselves in hunger and thirst. These are natural appetites, while the cravings of the system for alcohol is the result of disease produced by its use, and more or less marked, depending upon the injury it has caused the nerves or tissues.

The condition of the inebriate is fearful. He is in a state of unrest throughout the whole system, and the urgency for relief is so great that very few have sufficient power of will to resist. What is denominated appetite is therefore a state of suffering consequent upon disease, to which medical science has given the name of Dipsomania (thirst madness). It is as certainly a disease, as fever or pleurisy, and the cravings for relief are almost beyond human power to resist.

I pity the poor drunkard who, without knowing the true nature of alcohol, has brought this fearful disease upon himself, for which there is no cure to be found, except total abstinence from every kind of intoxicating liquor. If he will do this he will soon find the shackles by which he is bound, broken; but if, regardless of consequences, he persists in the use of the poison, disease, disgrace, and death will soon finish his course.

But now that the demonstrations of science have proved the true nature of alcoholic drinks, a man who has not become a victim of the "thirst mania," but continues to be a moderate drinker, under the delusion that he is in no danger, is doing an injury to society. The bad example of one respectable moderate drinker on the rising generation is worse than that of twenty confirmed drunkards.

If the moderate drinker would abandon his cups, it has been calculated that drunkenness would be all but

annihilated in twelve years. We should only behold here and there a solitary victim, holding out by virtue of a strong constitution.

These few and rare examples are used by the advocates of temperate drinking as proofs that alcohol is not injurious. Did these advocates of temperate drinking ever reflect how much longer these old inveterate drinkers might have lived, how much happier they might have been, and how much more useful they would have been to themselves, to their families, and to society if they had been abstemious all their lives.

But against this kind of argument I can quote more examples of vigorous old age and remarkable longevity of men who never indulged in the use of alcoholic liquors. It is estimated that in this country more than seventy-five thousand drunkards die every year, but the grand army of drunkards is kept constantly full, recruited from the ranks of the temperate drinkers. Why, a temperate drinker is only a recruit drilling for the grand army of drunkards, and the chances are that he will stagger into the ranks and keep step to the music of the toddy-stick before he is aware of it, and then there will be another man lost! Yes, lost to himself, lost to his family, lost to society—a living corpse.

But to return to the physical effects of alcohol, we find that beyond the point where it can be useful as a medicine, it first induces a diseased condition of the

nerves, which is manifested by the general symptom of craving for alcoholic stimulants, or a depraved appetite. In the second place, entering the system unchanged, it impairs the vitality of the blood. Careful examinations of the blood have been made in order to determine what becomes of alcohol when taken into the system. When more is taken than can be employed as a proper medicine, it passes into the blood, and circulates in all parts of the body, deranging the action of the heart and capillaries, confusing the brain and impairing the vital force. It has been decided by careful investigations that a large portion, if not all, of the alcohol drunk undergoes no change in the blood, but that it exists there a foreign substance, like a mote or grain of sand in the eye, and that which is denominated stimulation is, in fact, irritation; and the excitement caused by the effort to throw off the irritating substance wastes the energy and life of the system.

Its cumulative effects are to produce disease of the stomach, and a depraved appetite; it next expends its force upon the neighboring organs, inducing either disease of the liver, fatty or fibroid degeneration of the stomach, heart, etc., Bright's disease of the kidneys, and various other diseases which are fatal to health if not to life; the brain also is often diseased in function and at a later period in structure, and paralysis, insanity, delirium-tremens, apoplexy and death are the

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result ; at last the alcohol is expelled from the system by the kidneys, from the lungs, and through the pores of the skin. In the brains of men who died drunk, it has been found in as pure a state as when taken into the stomach, it has been distilled from the urine, tissues, brain, spinal cord, nerves, etc., all tending to prove that most of it undergoes no change while it remains in the system, and does not give any *permanent* nourishment, or *create* any strength.

It acts as a stimulant or an irritant, and excites for the time greater activity in the power already existing, *but it creates no new strength or power* ; acting like a whip or spur applied to a horse, to produce greater exertion and speed for the moment, but by these undue efforts the horse suffers in the end, and so does the man. The *Popular Science Monthly*, one of the ablest publications in America, conducted by E. L. Youmans, teaches that, "In the scientific education of the people no fact is deserving of more special comment than *the fact, that excitement is wasted force*, the running down of the machine before it has served out its time of motion."

There are those who boast of the amount they can drink without suffering from inebriation if the liquor is pure. Such persons do not understand that alcohol, however pure, is itself a poison, and that they are in greater danger than those who complain that it flies to the head when they drink it. This last class are more

likely to be restrained when the consequences may be so serious or disgraceful. Not only do the special organs become involved through the effects of the poison, but the whole living organism is impaired and life is cut short.

It has been demonstrated on all sides, at the forge, in the work-shop, in the field, on the march, in the Arctic regions, and in the torrid zone, in physical and intellectual labor, in training for athletic combats, and in trials of skill, that the liquor drinker fails to cope with the total abstainer.

I have said that life is cut short. The table given below which Professor Parkes uses as an illustration of this fact in his great work on Hygiene (p. 270), is taken from "Neison's Vital Statistics." All these deductions are drawn from observations on three hundred and fifty-seven persons, and he says, the facts connected with these persons are well authenticated.

A TEMPERATE PERSON'S CHANCE OF LIVING IS,	AN INTEMPERATE PERSON'S CHANCE OF LIVING IS,
At 20 — 44.2 years.	At 20 — 15.6 years.
„ 30 — 36.5 „	„ 30 — 13.8 „
„ 40 — 28.8 „	„ 40 — 11.6 „
„ 50 — 21.25 „	„ 50 — 10.8 „
„ 60 — 14.285 „	„ 60 — 8.9 „

Professor Parkes further remarks that, "very striking evidence in favor of total abstinence, as contrasted

with moderation, is given by the statistics of the United Kingdom Temperance and General Provident Institution (a kind of Life Insurance Company of London). One section consists of total abstainers, *another of persons selected as not known to be intemperate*. The claims for five years (1860-70) anticipated in the Temperance section were £100,446 ; but there were only claims for £72,676. In the general section, the anticipated claims were £196,352 ; and the actual claims were no less than £230,297."

There is the eloquence of truth in these figures, which no arguments in favor of temperate or moderate drinking can get round or overthrow.

The influence of alcohol is also seen on the masses of the people, in the fact that it fits them to become the prey of epidemics, as the constitution poisoned with alcohol cannot resist the poison of cholera, fevers, etc.

I cannot omit to speak of the offspring of the inebriate. The inheritance is a sad one. A tendency to the disease of the parent is induced as strong, if not stronger than that of gout or consumption, and with this tendency he must wage perpetual warfare or become a drunkard. The tendency referred to, has its origin in the nervous system. The unfortunate children come into the world with a defective organization of the nerves, which ranges from the inherited tendency through all grades to idiocy. In an institution near

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Boston, Dr. Howe reports that of three hundred idiotic children under his care, one hundred and forty-three were the children of drunken parents. The Divine edict that, "The sins of the parents will be visited upon the children until the third and fourth generation," is here strikingly verified.

These are the effects of the improper but common use of alcoholic liquors in their purest state, but the dealers in them in this and other countries, have resorted to the most fearful adulterations to imitate the pure article and increase their profits. So common has this become, that it is now almost impossible to procure distilled or fermented liquors pure, even for medical purposes.

Dr. Draper, Professor of Chemistry in the Medical College of the University of New York, some time since analyzed thirty-six samples of brandy, whiskey, etc., mostly taken from the bars of first class hotels and restaurants in the city of New York, where liquors are retailed at the highest prices and supposed by the drinkers to be pure, and he found only four samples that did not contain fusil oil and coloring matter of some sort. In the lower and second class bars he found not only fusil oil, but cayenne pepper, salt and other substances. These mixtures were sold for pure full-proof liquors, when the analysis showed but about thirty-two per cent. on the average; it should have

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given fifty per cent. of alcohol, or in fact thirty-six per cent. below proof of spirits, but the deleterious chemicals with which the liquor was adulterated would produce the effects of intoxication, and the drinker was deceived, for instead of solacing himself with pure liquor, he was impregnating his system with compound poisons.

Fusil oil, or amylic alcohol, as it is called in chemistry, is one of the products of distillation obtained from all substances containing starch—like corn, potatoes, wheat, etc.—and more or less is found in all these alcohols according to the method of distillation and rectifying. Dunglison, one of the highest authorities, says it is an acrid poison and destroys the mucous membrane of the stomach. It is nearly worthless by itself, and is produced as the last product of distillation, and if mixed with the ethylic alcohol, it greatly reduces the cost of the liquor. Much more water can be put in the liquor where the amylic alcohol or fusil oil is allowed to remain in it, and is not removed by the process of rectifying. In fact some of the manufacturers of imitation liquors recommend adding it to inferior liquors, in order to “reduce them” or “lengthen them out,” as they term it. But it means, to enable them to add more water and still keep up the intoxicating quality of their liquor.

The immense amount of whiskey made in this country

furnishes the basis for most, if not all, of the imitation liquors and wines, and the presence of so much fusil oil invariably found in them is due, first, to the fact, that the distillers have discovered methods by which they can get a much larger quantity of alcohol out of a given quantity of grain than formerly. By adding blue vitriol and an extra quantity of yeast to their mash, they hasten the process of distillation by inducing a fermentation in about twenty-four hours that formerly required seventy-two. By thus artificially hastening the distillation, more fusil oil and other impurities are mingled with the whiskey, and its dangerous and deleterious qualities are greatly increased. And, further, to get the largest amount of alcohol possible out of a given quantity of grain, they carry the process of distillation to the farthest possible extent, thus getting into the last portion of the product, most, if not all the amylic alcohol or fusil oil.

The only way to purify these whiskies and to get rid of the fusil oil is by rectifying. When this is done, the whiskey is sold at various degrees of strength, under the different names of French spirits, pure spirits, or Cologne spirits, and these are used for making the imitation liquors, and the reason why so much fusil oil is commonly found in the counterfeit brandies, rum and wines is, that the whiskey which is used in making them has not been properly rectified, and possibly not

rectified at all. If a large portion of the fusil oil remains in the whiskey the stronger it will be for intoxicating purposes, and the manufacturer can increase his profits by putting in more water ; and mixing in some kind of drug to make it bear a bead, and the drinker, when he feels the intoxicating effects coming on, will be satisfied that he has been furnished good, pure, strong liquor, when in fact it is many degrees below unadulterated alcoholic drinks.

Whenever there is a failure of the grape crop in France, there is always a large demand for raw whiskey from that market, which comes back to us in due time, mixed, and which is sold here in the shape of pure French brandies and wines. We also import large quantities of cognac oils and liquor essences, flavoring matters, and other drugs to be used by American manufacturers of counterfeit liquors. Many of these preparations are made in this country, and to add double-refined rascality to villainy, some of them are adulterated, so that the compounder of these mixtures does not know himself exactly what quality of devil's broth he is brewing.

The amount of adulterated liquors is enormous ; and with a few exceptions the entire liquor traffic of the world is not only a fraud, but (perhaps without all of the dealers being aware of the fact) it also amounts to a system of drugging and poisoning.

The business of making adulterated liquors has been

so simplified that any novice who knows enough to make a punch or a cocktail can learn in a short time how to make any kind of liquor that will pass muster with nine-tenths of the drinking community. The oils and essences are within the reach of any dealer, wholesale or retail, and, with the chemical preparations, he can procure the directions for making a large or small quantity in a short time.

Many books have been published in England and this country giving instruction on this subject. The dealers in these articles observe secrecy and caution. In some of their circulars they say to their customers that, "goods ordered to be forwarded by express and collected for on delivery, are sent with the amount only on the collection bill, *giving no indication of the nature of the articles*, and a detailed bill of items sent by mail." They also say, for the purpose of encouraging the compounders in this country that, "The wine growers of Europe make use of compound ethers and oils to convert the grain spirit into brandy of superior quality, and that the liquors prepared with their flavors mix with the foreign in most economical proportions."

If the oils, essences, and other chemical preparations, are wanted for converting corn whiskey into any other kind of liquor, they can easily be obtained. You can procure brandy oil enough to change eight barrels of corn whiskey into eight barrels of French brandy for

sixteen dollars, and enough chemicals to convert sixteen barrels into old Holland gin, London cordial gin, Old Tom gin, or Schnapps, for twelve dollars; to make old Bourbon, malt, Monongahela, rye or wheat whiskey, enough of these chemical compounds can be purchased for eight dollars to make four barrels; and to make four barrels of Irish or Scotch whiskey, the chemical materials can be procured for ten dollars. Then there is the cost of the coloring matter, and what the dealers call "age and body preparation." By using these drugs new whiskey is converted into any kind of liquor, of any age or color, in a short time. Some of these materials are known to be deadly poisons. The more highly the imitation liquor can be charged with the cheap poisonous drugs, to supply the intoxicating properties of alcohol, the more water can be added, thus reducing the cost, and keeping up the intoxicating power of the liquor. These preparations can be procured in any quantity. A small retailer can purchase a small quantity, sufficient to convert a gallon or two of whiskey into brandy, gin, or rum, as his daily wants may require, but they are generally used for larger quantities.

In addition to the foregoing there are an immense number of receipts for making all kinds of intoxicating liquors. From various authentic sources I have procured a large number of these, which have been made

use of at different times, or are in use now. For the benefit of moderate drinkers I will give a few; and as cider is generally considered a very wholesome beverage, they can always procure a sufficient quantity of it, even in those years when the apple crop fails.

To make sweet apple cider :

20 pounds of brown sugar,  
1 *pound of cider flavor*,  
20 gallons of water,  
1 pint of good brewers' yeast.

Add to each ten gallons of this mixture one quart of rectified spirits.

To make Cognac brandy :

40 gallons of French spirits,  
 $\frac{1}{4}$  pound extract of chicory,  
1 pound of green tea,  
 $\frac{1}{4}$  pound black currant leaves,  
1 quart of burnt sugar or lime water,  
A small quantity of simple syrup, to soften and give  
it age, caramel or burnt sugar to color.

Before the war, when real French brandy could be imported for \$2.50 per gallon, and corn whiskey was cheap, this imitation of brandy could be made for less than 37 $\frac{1}{2}$  cents per gallon.

To make French brandy that can be sold for Cognac, Sazarac, or Martell's by varying the coloring :

97 gallons pure spirits,  
7 pounds red argolls,  
3 pounds acetic ether,  
3 gallons wine vinegar,  
7 pounds bruised raisins,  
1 ounce bruised bitter almonds.

Distill this mixture, and add oak shavings, catechu and caramel to color, then throw in a few bits of old Russia leather, to give the flavor of age.

To make an imitation of pure old Monongahela whiskey :

40 gallons high-proof corn whiskey,  
3 gallons tincture Guinea pepper,  
40 gallons water,  
1 quart tincture pellatory,  
2 ounces acetic ether,  
1½ gallons strong tea.

This will produce from the forty gallons of corn whiskey, about eighty-four gallons of what will be sold for pure old Monongahela. The fusil oil not being rectified out of the whiskey, the intoxicating quality will be superior ; and, aided by the tincture of pellatory, disguised with pepper, ether, and strong tea, enables the dealer, to add largely of water, and also to use cheap whiskey.

To make Holland gin :

15 gallons proof spirit,  
1 gallon gin essence,  
1 quart white syrup.

Mix thoroughly, and filter if necessary. This is simple, but there is no gin in it, so it is a pure fabrication, as almost every one of the imitation liquors are.

Real imported Holland gin sometimes has sugar of lead added to it, to give it a peculiar roughness and flavor, *which is much esteemed by some gin drinkers.*

The following is a favorite receipt for making a very high-flavored Holland gin, which is much admired by some gin drinkers, and it is no wonder so many have Bright's disease of the kidneys :

80 gallons French spirits,  
1 pint oil of turpentine,  
3 ounces oil of juniper,  
1 drachm essential oil of almonds. (*This is almost prussic acid.*)  
2 ounces creosote. (*This is a deadly poison for which no antidote is known.*)

Simple syrup enough to soften, and give the appearance of age.

To make a very rich flavored French brandy :

100 gallons pure spirits,  
2 quarts acetic ether,

4 ounces cassia buds,  
2 ounces bitter almonds,  
6 ounces orris root,  
1 ounce cloves,  
2 quarts white wine vinegar,  
1 pound catechu,  
2 gallons Jamaica rum,  
1½ ounces cayenne pepper,  
1 quart caramel for coloring.

Let it stand two weeks, occasionally stirring it.

To make old London cordial gin of the highest quality :

Ninety gallons of gin, oil of almonds one drachm ; oils of cassia, nutmeg and lemon, of each two drachms ; oils of Juniper, caraway, and coriander seed, of each three drachms ; essence of orris root, four ounces ; orange flower water, three pints ; lump sugar, fifty-six to sixty pounds. The oils and essences must be dissolved in a quart of spirits of wine, and the sugar in three or four gallons of water. The essences must be added gradually to the gin, until the requisite flavor is produced, when the dissolved sugar must be mixed in along with sufficient quantity of soft water, holding four ounces of alum in solution, to make up one hundred gallons. When the whole is perfectly mixed, two ounces salts of tartar, dissolved in two or three quarts of water, must be added, and the liquor again well

rummaged or stirred up, after which it must be tightly bunged down, and allowed to repose. In a week or ten days it will have become brilliant, and ready for sale, or racking off and bottling. Many persons use this pretty freely for the benefit, as they suppose, of their kidneys; and such a compound of compounds must produce an effect not only on their kidneys, but also on every other organ of the body.

To make brandy which can be sold for pale or dark brandy :

- 40 gallons pure spirits (*common proof*),
- 1 drachm Cognac oil. (*This is a deadly poison.*)
- 1 pint spirits of raisins,
- 1 pint spirits of prunes,
- 1 drachm tannin powder,
- 1 ounce acetic ether,
- 3 drops oil of neroli, dissolved in 90 per cent. alcohol.

Color to make dark or light brandy, according to the market you are preparing it for. Fusil oil is found in nearly all the imitation brandies, showing that the whiskey used for the basis of them has been very imperfectly rectified.

When real brandy is first distilled from wine it is quite colorless, but after being kept some time in oak casks it becomes of a pale amber color, the color being

derived from the wood. Very dark brandies owe their color to caramel, or burnt sugar. The characteristic taste of brandy is due to the presence of a volatile oil obtained from the skin of the grape.

To make old Bourbon whiskey :

40 gallons pure rectified spirits,  
 $\frac{1}{2}$  pint of brandy coloring,  
 $\frac{1}{4}$  pint of concentrated essence of Bourbon,  
1 pound age and body preparation.

Absinthe is one of the most deadly poisons, nevertheless they make a counterfeit absinthe as follows :

2 ounces of essence of absinthe,  
4 ounces green coloring,  
1 gallon of simple syrup,  
4 gallons of rectified spirits.

Here we have about 5 gallons of absinthe cordial, which contains 2 ounces of deadly poison, and 2 gallons of *pure* alcohol.

To make Santa Cruz rum :

45 gallons N. E. rum,  
5 gallons Santa Cruz rum,  
4 drachms vanilla essence.

To make Jamaica rum :

60 gallons proof spirit,  
1 pound rum essence.

This is simple and easy, but when we think we are drinking good old Jamaica rum, we are served with corn whiskey.

Wines are as universally and as badly adulterated as the distilled liquors. In fact, prepared chemicals can be found in the stores of men who deal in these articles. to make every kind of wine, with directions how to mix them. Whiskey is used as the basis for nearly all wines, and upon chemical analysis fusil oil is almost always found in counterfeit wines. What was sold by one of our respectable New York hotels for fine old port wine was analyzed, and found to contain 25 per cent. of alcohol, some *fusil oil*, extracts of cherry and elderberry, and some kind of coloring matter. This is a fine medicine to give sick persons to strengthen them.

Receipt for making Madeira wine :

20 pounds of figs, mashed up,

50 pounds raisins,

20 ounces linden or tilla flowers, with the leaves on,

3 drachms of Turkish rhubarb,

10 grains of cloves,

3 gallons of sugar syrup.

Infuse the above for ten days in 30 gallons of spirits, then add 90 gallons of water, and filter, and you have nearly 130 gallons of what is sold for pure old Madeira wine, without a drop of grape juice in it, but, upon analysis, fusil oil will sometimes be found.

To make sherry wine :

100 pounds sugar,  
40 gallons spirits,  
200 gallons water,  
70 gallons sherry wine.

Color according to the kind of sherry you wish to imitate. Agitate and stir this mixture up for several days, and we have 230 gallons of what is sold for pure old sherry wine.

"A portion of the so-called champagne wines consumed in this country is composed of the expressed juice of turnips, apples, and other vegetables, to which sufficient sugar of lead is added to produce the necessary sweetness and astringency. The terrible headaches and depression of spirits that follow fashionable champagne suppers are attributable to the united poisons of lead and alcohol."\*

"Logwood is the great coloring matter for wines. Blackberries, elderberries, and bilberries are also used. Wines are adulterated with distilled spirits, lime salts, tannin, alum, lead, copper, cider, perry, etc. Port wine, as sold in the market, when not entirely counterfeit, is usually a mixture of pure port, or Marsala, Bordeaux, and Cape wines with brandy. Inferior port is still more

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\* Wetherbee's "Toxicology."

highly adulterated with logwood, elderberries, catechu, prune juice, sandalwood, and alum.”\*

Many people suppose if they go to the Custom-house, and buy liquors in bond, under Custom-house lock and key, they will get them pure, but in this they are mistaken, for the liquors are as badly drugged in other countries as they are here. Professor Parkes gives an analysis of between forty and fifty of the different kinds of wines made in Europe. He says it has been stated that the fermentation of the grape, when properly done, cannot yield more than 17 per cent. of alcohol, and that anything beyond this has been added, and that some of the finest wines do not yield more than from 6 to 10 per cent. He found, upon analyzing the port, sherry, and Madeira wines in London, that the port ran from  $16\frac{5}{8}$  to  $23\frac{1}{2}$  per cent. alcohol; the sherry from 16 to 25, and the Madeira from  $16\frac{3}{4}$  per cent. to 22, and champagnes from  $5\frac{1}{2}$  per cent. to 13. The other wines averaged from  $6\frac{3}{4}$  to 19 per cent. Mulder on “Wine” (p. 186) quotes Guijal to the effect that pure port never contains more than  $12\frac{3}{4}$  per cent., but Mulder doubts this. Dr. Gorman stated before a Parliamentary Committee that pure sherry never contains more than 12 per cent. of alcohol, and that from 6 to 8 gallons of alcohol is added to every 108 gallons

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\* Parkes’ “Hygiene.”

of sherry. Some port used in the Queen's establishment contained but  $16\frac{5}{8}$  per cent., the highest was  $18\frac{1}{4}$ ; and the sherry only 16, and the clarets from  $6\frac{7}{8}$  to 7 per cent. of alcohol. These were the purest wines to be found in London. Upon comparison we should find that the foreign wines in our market would show a much larger per cent., and as the corn whiskey they obtain from the United States is the cheapest form of alcohol they can procure, it is used for this purpose; and when not perfectly rectified, fusil oil will be found in the foreign wines.

Thudichum and Dupré (on "Wine," p. 682) state that natural wine may contain 9, while the maximum limit is 16 per cent. of alcohol (of weight in volume). They also state that a pipe of 115 gallons of port wine has never less than three gallons of brandy added to it, and the rich port wines have from thirteen to fifteen gallons added.

I have not space to say more of the adulterations of wines and ardent spirits, but it is a system of fraud and deception the world over. Ales, porter and beers are as badly adulterated in this country and England as other liquors are.

Professor Gallatin, of the chemical department of the Cooper Institute, has analyzed many samples of the best ales from the largest breweries in New York and vicinity, and others of the best reputation, and found

none free from adulteration. He did not find as deadly drugs as the English brewers are said to use, or as the English books recommend, but he found that salt, alum, and lime are extensively used. "The substances added to give 'head' to beer are alum, salt, and ferrous sulphate."\* The effect of these adulterations on the consumer is very injurious. The cumulative effect of alum is to produce a general derangement of the digestive organs, and the diseases which grow out of it.

The English works recommend *coccus indicus*, sweet flagroot, grains of paradise, alum, capsicum, absinthe, nutgalls, potash, and several other drugs. Dr. Beck, in his work on "Adulterations," asserts that they use strychnine, opium, and hyosciamus, all deadly poisons. Keeping new ales until they are old is quite expensive, and they are converted into old ales cheaply and in a short time by adding oil of vitriol (sulphuric acid), and the new ale acquires almost immediately the flavor of hard old ale, so much admired by beer drunkards.

*Coccus indicus* is largely imported into England, ostensibly for tanners' use, although it is never used by them, but finds its way into the brewers' hands, in spite of a severe law against its use, and is used by them to give greater intoxicating effect to their beer,

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\* Parkes.

and by adding water they reduce its cost and retain the intoxicating properties. It is also imported into this country, and it is said that it is used by some of the American brewers for the same purpose. It is obtained from the seed or fruit of a shrub growing in the East Indies, and is imported in various sized packages. The trade-mark is "B. E.," meaning Black Extract. It is an acrid-narcotic poison. Dr. Taylor, one of the highest authorities on the subject of poisons, experimented with *coculus indicus*, and killed a rabbit with two drachms in two hours, three drachms killed one in an hour, half an ounce in a quarter of an hour, and one ounce killed one in four minutes. It is also sometimes called fishberry, as fishermen use it to cast into the water, and all the fish within reach of its influence become paralyzed, and float on the surface of the water, where they can be easily taken. Its poisonous effects more nearly resemble those of alcohol than any other known substance.

The excessive use of malt liquors produces softening of the brain, and many other diseases. When it is adulterated its effects are always injurious, *and it is now so generally adulterated that the only safety is in letting it alone.*

With regard to its value as a diet when it is pure, authorities differ. Dr. E. Lankester says "beer contains but one per cent. of nutritive matter, and is not a

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thing to be taken for nutrition at all." Professor Lyon Playfair says 100 parts of ordinary beer or porter contains  $9\frac{1}{2}$  parts solid matter, of which only about one-half part consists of flesh-forming matters ; in other words, it takes 1.666 parts of ordinary beer to obtain one part of nourishing matter. Baron Liebig informs us that 730 gallons of the best Bavarian beer contains exactly as much nourishment as a five-pound loaf of bread or three pounds of beef."\* Professor Parkes says "that in beer there appears to be five ingredients of importance, viz., the extractive matters and sugar, the bitter matters, the free acids, and the alcohol. The first, no doubt, are carbo-hydrates, and play the same part in the system as starch and sugar, appropriating the oxygen, and saving fat and albuminates from destruction. The bitter matters, he says, are supposed to be stomachic and tonic, though it may be questioned whether we have not gone too far in this direction, as many of the highest-priced beers contain now little else than alcohol and bitter extract."

The danger to those who use these adulterated and imitation liquors is fearfully augmented, even those made with whiskey, which has been rectified so as to be free from fusil oil, are extremely deleterious. Those who drink these mixtures are taking into their blood,

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\* "Bacchus Dethroned," p. 92.

brains, spinal cord, nerves, and other organs of their bodies, diluted alcohol mixed with other poisons, colored and flavored with oils and essences. These produce congestion of the brain, ending in delirium-tremens. One of the worst features about these drinks is, the injury is permanent. Those who suffer from their use, especially those who have had mania-a-potu, it is said, are left with the functions of the brain partially paralyzed and never fully recover ; their continued use in a short time produces death.

Until within a late period, it was believed that alcoholic drinks warmed the system, but by repeated experiments made in Germany, France and this country, it is now established that their invariable action is to lower the temperature of the body. Professor N. S. Davis, M.D., of Chicago, claims to have established this remarkable fact by experiments which he performed himself in 1850 and repeated in 1867. Dr. Anstie says, the first decided demonstration was made by Frölich and Litchenfels in 1852. Other eminent men have repeated the experiments and found the same results. A centigrade thermometer was used, and a small glass of Hock wine or a small glass of brandy lowered the temperature of the body from four to six-tenths of a degree in a few minutes, and in a poisonous dose administered to a dog, there was a fall of from four to five degrees in one or two hours. Experiments prove that alcohol has

the same effect on the lower animals as it has on man.

If you saturate a piece of rag in alcohol and apply it to the arm, preventing evaporation by means of an oil silk bandage, in a short time the part becomes hot, painful and inflamed, so that you are compelled to remove the rag. This proves that alcohol is an irritant and has the power of inflaming.

When taken into the stomach a similar effect is produced upon the mucous membrane, the blood flows to the part in contact with the alcohol and the surface becomes congested; mucous is also thrown out by the membrane to lubricate the inflamed parts and preserve it from irreparable damage, the increased flow of blood to the surface acted upon by the alcohol, induces a sensation of warmth. This is the real meaning of that warming and comforting of the stomach after a glass of spirits which beguiles the drinker. That alcohol thus affects the stomach has been proved by ocular demonstration in the case of Alexis St. Martin, operated on by Dr. Beamont.

Professor Parkes, from whose great work on Hygiene I have already quoted, after giving the most impartial, exhaustive and learned dissertations upon the physical effects of alcohol, and its physiological and moral effects, sums up the whole subject with this conclusion, and says (p. 294): "Looking back to this evidence, it

may be asked, Are there any circumstances of the soldier's life in which the issue of spirits is advisable, and if the issue at any time lies between the issue of spirits and total abstinence, which is the best? To me there seems to be but one answer. If spirits neither give strength to the body, nor sustain it against disease, are not protective against cold and wet, and aggravate rather than mitigate the effects of heat—if their use even in moderation increases crime, injures discipline, and impairs hope and cheerfulness—if the severest trials of war have been not merely borne, but most easily borne, without them—if there is no evidence that they are protective against malaria or other diseases—then I conceive the medical officer *will not be justified in sanctioning their use under any circumstances.*"

Dr. Carpenter quotes from Dr. Knüll a statement that the Russian army on the march in cold weather not only use no spirits, but no man who has lately taken any is allowed to march. In tropical climates the best authorities condemn the use of alcoholic beverages. The records show that both on common tropical service, and on march in India, the teetotallers were more healthy and vigorous and far better soldiers than those who did not abstain.

Dr. Frank H. Hamilton, one of our eminent army surgeons who served in the Union Army during the rebellion, says, "In our own mind the conviction is estab-

lished by the experience and observation of a life, that the regular routine employment of alcoholic stimulants by men in health is never, under any circumstances useful. We make no exception in favor of cold, or heat, or rain, nor, indeed, in favor of old drinkers, when we consider them as soldiers."

If alcohol is not food and takes no part in nutrition, many will be ready to ask, Why habitual drinkers of spirits, wine and beer grow fat, and increase in weight. Professor N. S. Davis, says, the presence of alcohol in the blood, not only retards atomic changes in tissue, but diminishes the amount of oxygen taken in through the lungs. Consequently, the carbonaceous elements of the blood and tissues do not become oxidated as rapidly as when the alcohol is not present, and they accumulate in the form of *fat*. And this process is sometimes carried so far that the heart, liver and kidneys undergo more or less fatty degeneration, constituting incurable forms of disease.

The increase of bulk and weight in these cases is not from an increase of natural nutrition, but a slow accumulation of hydro-carbonaceous material from retarded metamorphosis. The individual fattened under such influences, invariably diminishes in physical activity and power of endurance, in proportion to the increase of weight. Those who imagine that to diminish the waste of the tissues by diminishing atomic changes, is

equivalent to the actual assimilation and addition of new atoms, forget that all the phenomena of life in the physical organization are the direct result of such atomic changes, and that whatever diminishes these actually diminishes physical life, and to stop them is to stop life.

I have now given in as condensed a form as possible, what is believed and taught by a large majority of the scientific men who have written on this subject in the last fifty or seventy-five years. These opinions and conclusions have been collected from the writings of Orfila, Christisson, Dr. Taylor, Pereira, Professor Binz, Dr. Lallemand, Perrin, Dr. Willard Parker, Professor Edmund A. Parkes, Professor Duroy, Dumorel, Magnus, Dunglison, Dr. James Edmunds, Powell, Professor N. S. Davis, Dermarquay, Wetherbee, Burns, Dickenson, and others.\*

Some eminent men hold opinions that differ in some respects from those that I have advocated, and as my only desire is candidly and impartially to state nothing but the truth, I will state that Dr. Anstie says, "The first thing that claims attention is the question, whether alcohol is destroyed within the body," and opposes the doctrines of Lallemand, Perrin and Duroy, and he avers that on this subject he is supported by Dr. Dupré and Professor Binz, and denies that alcohol is "largely

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\* See note page 68.

expelled by the excretory organs in an unchanged condition."

"The next question (he says), is, whether alcohol can actively subserve the functions of life and thus deserve the name of food? The time is not ripe, he avers, for a complete inquiry into the possibility of alcohol being utilized for the construction of certain varieties of tissue;" and he adds, "I am free to allow that the evidence so far, on the whole supports the belief that with certain exceptions, alcohol is active rather in the direction of repressing than of forwarding the growth of new tissues."

Dr. Edward Curtis, teacher of *Materia Medica* and *Therapeutics* in one of the leading New York Colleges, adopts the doctrines of Professor Anstie; he says that, "in ordinary amounts alcohol is wholly consumed, transformed in the system, and, by the nature of its chemical composition is capable, like certain elements of ordinary food, of thus yielding *force* which can be used by the economy to do life work, etc. And thus within certain limits of dose, alcohol is transformed like ordinary food in the system without producing any injurious effects, and yielding useful force for the purposes of the economy, must be considered as a *food* in any philosophical sense of the word. And he says, "an important point to know, and one little understood, is, that this food-action is attended with no exciting or intoxicating influence, but the whole effect, like that of

ordinary food is seen in the maintenance or restoration, according to circumstances, of that balance of function called health."

"But, if taken in greater quantity than can be utilized as a force-yielding food, the excess of alcohol acts as a poison, producing a well-known train of perturbations of function." And again—a point not well understood—"all signs of departure from the natural condition in the drinker, from the first flushing of the cheek, brightening of the eye, and unnatural mental excitement, to the general paralysis of complete drunkenness, belong equally to the poisonous effect of alcohol." That is (he remarks), for I wish strongly to insist upon this point, "even the early phases of alcoholic disturbance, which are often improperly called 'stimulating,' are part and parcel of the injuriously disturbing influence of overdosage, and must be put in the same category with the more obviously poisonous effects of pronounced intoxication."

"Alcohol has thus a two-fold action. First, it is capable, in proper dose, of being consumed and utilized as a force-producer; in which case there is no visible disturbance of normal function. Such action cannot be distinguished, either by the drinker or the physiologist, from that of a quickly digestible fluid food, and is no more an 'excitement,' or 'stimulation,' followed by a 'recoil,' or 'depression,' than is the action of a bowl

of hot soup or a glass of milk. The second action is the poisonous influence of an excess of alcohol circulating in the blood, which makes itself sensible to the drinker by peculiar sensations and disturbances, and is not only followed by 'depression,' but is itself a form of depression—that is, a disturbance of balance; an unnatural perturbation of the normal working of the functions."

Professor Curtis then says (with great significance): "Every reader of these lines will at once ask, What is the limit as to quantity within which alcohol exerts only a food-action, and beyond which it begins to poison by excess? This question cannot be answered categorically, for it so happens that the 'poison line,' as it has been aptly called, is a shifting one. Even in health it varies according to age, sex, individual peculiarity and habit, and even in the same person, according to his physical condition for the time being. When fatigued by bodily or mental work, when suffering from emotional agitation, as anxiety or fear; when worn by loss of sleep, etc., etc. And in more formal morbid states, as in many diseases, the *poison-line* often shifts to an astounding degree."

These are all the strong points Professor Curtis advances to support the doctrine that alcohol is food, and accepting them as true, it is certainly a most dangerous kind of food, and is no more to be called food

by the teachers of men than arsenic should be called food in any sense, "philosophical" or otherwise.

We know that medical men prescribe arsenic in small doses for cutaneous diseases, and as a tonic and alterative. We know also that "in Lower Austria, Styria, and the hilly country towards Hungary, arsenic is used to considerable extent under the name of "Hidri," and that its effect is to produce clearness of the skin, freshness to the complexion, and plumpness to the figure; and also that it improves the breathing and gives longness of wind, so that steep and continuous heights can be climbed without difficulty, and also that upon animals the effect is similar to those produced upon man. It fattens and plumps out the horse, gives a bright and glossy skin, and an appearance of high health and condition."\* These are facts known to every medical man, and yet we never hear them call arsenic anything else but poison, either in large or small doses; and through their influence its sale is regulated by law, *because it is a poison!* Yet every chemist knows that alcohol is as deadly a poison as arsenic is, and every man of common sense knows that if alcohol was unknown, and the same number of deaths were occasioned every year in New York by the use of arsenic as is now occasioned by the use of alcohol, the consequences to society would not be one-tenth as demoralizing as the effects of alco-

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\* "Chemistry of Common Life."

hol are now. For, although arsenic kills the same as alcohol, it does not brutalize and deprave men as alcohol does.

Professor Curtis fails to point out the dangerous fact, that the habitual use of this kind of food, as he calls it, is almost certain to produce a diseased appetite that will lead the poor victim to a drunkard's grave. If the "POISON LINE" is so shifting and uncertain, can any one but a skillful physician be trusted to prescribe alcohol with any more safety than any other poison can be prescribed? And he also fails to warn those he seeks to instruct, that, of every article that can be called food in any sense, "philosophically" or otherwise, there is no one that is so universally and dangerously adulterated as alcohol is, and no one that is so difficult for the habitual consumer to know is adulterated.

William A. Hammond, M.D., recently elected President of the Neurological Society of New York, stated in his inaugural address that alcoholic drinks in excessive doses are not only injurious to the individual who takes them, but are also in the highest degree ruinous to society, although, in judicious doses, they may serve the purposes of food, and giving force by lessening or retarding the waste of the tissues, may thus supply materials for the generation of force. He did not account for this, or tell how it was done, but simply assumed it as a fact. How much a judicious dose was he did not state.

His lecture was very able and instructive; he exhibited samples of alcohol he had in his experiments distilled from the brain, spinal cord, and nerves of a rabbit - which he had largely fed on bread soaked in whiskey for ten days.\* Experiments hitherto had not shown that the nerves and spinal cord absorbed alcohol. He then gave the following list of diseases and disorders of the nervous system, produced by the excessive use of alcohol. The catalogue, he stated, was made up from his note-books, and is based upon cases occurring in his private and hospital practice.

#### OF THE BRAIN.

Cerebral congestion.

Cerebral hemorrhage, with its consequences, apoplexy and paralysis.

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\* This was one of the most convincing and successful experiments ever demonstrated before a scientific audience, and reflects distinguished credit on Dr. Hammond. Now, if alcohol is found unchanged in the brain, nerves, spinal cord, etc., of the animal system, after using it ten days, may it not also be found in every other part of the body, and does not this satisfactorily account for what becomes of that portion of alcohol which has been taken into the system, and has not been fully proved to have been expelled by the excretory organs, (as we know a very large part of it is,) and does it not overthrow the "fluid food" doctrine, and confirm the chemical law laid down by Christisson, that "poisons which operate by entering the blood undergo no change in the system," and consequently cannot be called food?—J. G. D.

Meningeal hemorrhage.

Cerebral thrombosis.

Softening of the brain.

Aphasia.

Acute cerebral meningitis.

Chronic cerebral meningitis.

Abscess of the brain.

Multiple cerebral sclerosis, one of those diseases of which tremor is a characteristic symptom.

Every variety of insanity, including general paralysis.

#### OF THE SPINAL CORD.

Spinal congestion.

Antero-lateral spinal sclerosis.

Posterioro-spinal sclerosis (Locomotorata).)

#### CEREBRO-SPINAL DISEASES.

Epilepsy.

Chorea.

Multiple cerebro-spinal sclerosis, another of those affections characterized by tremor.

Athetosis, a remarkable disease which he was the first to describe, and which is now well recognized both in this country and in Europe. The case on which his description was based was one in which the patient was in the habit of drinking an immoderate quantity of gin daily.

## OF THE NERVES.

Anæsthesia.

Paralysis agitans.

Neuralgia in all situations.

Neuritis.

Neuro-sclerosis.

It will be noticed that sclerosis or hardening is a condition of all parts of the nervous system which alcohol probably often produces. It is doubtless the result of the direct action of alcohol on the nervous tissue.

In addition to being the exciting cause of many diseases of the nervous system, alcohol probably predisposes to various others in which no direct relation can be traced. Neither does its action stop here, for the descendants of persons addicted to the excessive use of alcohol are liable to various disorders of the nervous system, and there is some evidence to show that offspring generated during a fit of intoxication of either parent are often born idiotic.

He also stated that he thinks it probable that the impurities of alcoholic beverages add to their baneful properties, and advises discriminating legislation in favor of wines and malt liquors and against spirituous liquors."

There is a fearful responsibility resting upon the medical profession in this matter. It is to them we

look for correct instruction and advice. They know the idiosyncrasies of the family, are admitted to its inmost privacy, and possess its confidence. And if in familiar conversation with their patients they condemn the use of all distilled liquors, because they are "merely flavored alcohol, and do not possess the ingredients that give dietetic value to wine and beer;"\* and instead of encouraging the idea that to a certain extent they are harmless and nutritious "*fluid food*," impress upon their minds the scientific fact that it is as dangerous for them to tamper with alcoholic drinks as it is to tamper with any other medicine, and that the "*poison line*" which carries them to danger and to death is so easily and imperceptibly passed that they should not dare to use them without their express direction; this change of phraseology at the family fireside would help to produce a corresponding change in the common conversation and literature of the day, and would aid immensely to discourage dram drinking, and the social drinking customs of society.

With regard to the theory of Dr. Anstie, which is endorsed by Professor Curtis, that alcohol is not eliminated from the body, Professor Parkes states, (p. 277,) that "From experiments made by Dr. Anstie, an amount of one fluid ounce and a half caused the

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\* Parkes.

appearance of alcohol in the urine, which Anstie regards as a sign that as much has been taken as can be disposed of by the body." But, however much doctors may disagree on this subject, every uneducated man who has ever taken care of a drunkard during one of his fits of complete intoxication, knows that he can smell the liquor he has been drinking in his breath, in his urine, and in his perspiration. In fact, the alcoholic odor of his underclothes is sometimes as strong as if they had been saturated with diluted alcohol. Now, where does this unmistakable evidence of alcohol come from, if it is not eliminated in an unchanged condition from the poor drunkard's body by the excretory organs? And would not every fit of complete intoxication result in death, if it was not for the peculiar volatile nature of alcohol, which enables the system to free itself from its poisonous effects by eliminating it unchanged by the excretory organs?

But dangerous and alarming as the physical effects produced by the habitual use of alcoholic beverages and their adulterations are, the financial and moral dangers and consequences are no less fearful. J. N. Stearns, Esq., Corresponding Secretary of the National Temperance Society of New York, has estimated the retail value of intoxicating beverages consumed in the United States in the year 1872 at six hundred and sixteen million eight hundred and fourteen thousand four

hundred and ninety dollars (\$616,814,490). Merely to count this sum (at \$20,000 a day) would take a man one hundred years; or, in one dollar notes, it would cover 20,466 acres of ground. If in gold, and loaded in wagons, it would fill 1,045 of a ton each, and make a procession six miles long; or, if in silver, it would require 14,230 wagons, and the procession would extend seventy-five miles; and all this represents but one year's consumption. It is true that our Government receives many millions of dollars revenue annually from the duties and taxes levied on intoxicating liquors; but a fair statesman-like calculation will prove that every dollar received by the Government costs the country five or six dollars, to say nothing of the sickness and suffering, demoralization, pauperism, and crime which are the direct result of the liquor traffic.

This estimate is made, I suppose, from official sources, but if the amount was but one-half as much, it is enough to make us tremble for the safety of our country and its institutions. But remember that this is going on every year, and statistics prove that the percentage of increase is greater annually than the increase of population. The political economist, the statesman, and the philanthropist may well ask with astonishment, WHERE IS THIS TO END? It has been well said, that, "Should a foreign army land on our shores to levy such a tax as is caused by the consumption of alcoholic poisons, no

mortal power could resist the swelling tide of indignation that would overwhelm it."

Of the moral consequences I need not speak. We have only to go to the licensed retail liquor shops, and also the shops of the unlicensed dealers, and then go to the homes of the drunkards, and see the vice, poverty, and misery there; then visit the prisons, alms-houses, lunatic asylums, and hospitals, and look through the records of the criminal courts, and they will speak to us with an eloquence and pathos greater than tongue or pen can equal.

With the positive proofs of science, and the conclusive evidence everywhere before our eyes, no one, unless he is blinded by ignorance, a diseased appetite, or interest, can doubt that the liquor traffic is the great curse of our times, and that to do away with it, would do away with much of the sin, and a large part of the vice, crime, and poverty of our country.

No great reform which has benefited the human race has had more formidable obstacles to overcome than the temperance movement. First, there is the depraved appetite acquired or inherited by a large portion of our people; then the ignorance on this subject, the result of the false teachings of the present and past ages; also the literature of the past, with its bacchanalian songs and poetry in praise of drinking, and finally the power and influence of combined capital.

Already we have a "Wine and Spirit Traders' Society of the United States," composed of men of great ability and immense wealth, with its president, two vice-presidents, a council composed of twenty members, secretary, treasurer, eminent legal counsel, four standing committees, besides *a committee on legislation!* The ramifications of this society extend throughout the United States; and there is a provision in the by-laws for the admission, as honorary members, of persons and firms having their principal place of business elsewhere than in the United States of America, by the payment of one hundred dollars; and many of the largest manufacturers of intoxicating liquors in Europe have been admitted as members, determined not only to keep up, but to increase the consumption in the United States, of their brandies, wines, etc., which they can supply to an unlimited extent, "*though the vine should not blossom,*" provided they can get a supply from this country of RAW WHISKEY! There are, undoubtedly, some as high-minded and honest men engaged in the spirit and wine business, as well as among the brewers, as are to be found in any other branch of trade, who would not manufacture or sell counterfeit or adulterated liquors, wine or beer, and they have as great an interest in putting down the system of frauds and adulterations as the rest of the community.

The struggle is a great one. But we know that we

are working in the cause of truth and humanity, and for the good even of those who through ignorance or the love of gain are opposing this great movement; but with the truth in one hand and the law of Christian love in the other, *we shall succeed*. It has only been by performing great deeds that our country has attained its present rank among the nations. The more powerful and numerous the forces arrayed against us are, the more firm and determined should we be to press on to final victory.

The reform may not be accomplished in one generation, but we must continue the agitation of the subject, and by prayer, by organized societies, and public meetings, continue to educate the people. The children in our schools should be correctly instructed on this subject by teaching them scientific truth. In order to do this I have prevailed on Dr. Wetherbee, a learned Toxicologist, and professor of chemistry in one of our New York colleges, to prepare an elementary work on Toxicology, in which alcohol and its compounds will be treated scientifically, and its poisonous effects demonstrated. The work is nearly ready for the press, and we hope to have it in the schools and among the people in the course of the coming year.

By thus impressing upon the minds of the young, with their other studies, the scientific knowledge of the true nature of alcoholic drinks, and their classification •

with other poisons, there will be prepared a class of intelligent, educated men and women, to carry forward to final and complete success this righteous cause, which their fathers commenced under so many discouragements and difficulties.

The social customs with regard to drinking must be entirely changed, and it must be made unfashionable and disreputable. A grave responsibility rests upon the leaders of fashionable society in this matter, whose example has great weight and influence with all classes of the community. And in this work our pure minded and accomplished American women can render a special service.

The ill success of many of the temperance movements of the last fifty years has been clearly shown in a very able paper recently written by the Hon. Thurlow Weed, and published in the *New York Tribune*.

After reviewing the extraordinary and successful movement that originated in Baltimore some forty years ago, in which "reformed drunkards" were the principal actors, and showing how this really auspicious movement was seized upon by a different class of reformers, who not only "twisted" it out of its original channel and purpose but soon ran it off the track and into the ground; he says that, in the "Reformed Drunkards," labor, the laws of kindness, charity, and affection were observed, but that the ultra temperance men concerned

themselves very little about the thousands who were poisoning themselves with bad rum and worse whiskey.

That in the warfare against temperate drinkers a spirit of bitterness and denunciation was resorted to; and that the chairman of the executive committee of the State Temperance Society, in 1832, boldly and recklessly charged that every victim, of either sex, to that fearful scourge, cholera, was either an intemperate or temperate drinker of alcoholic liquors. This unfounded and cruel accusation was soon followed by a step which brought discord and strife into our churches. The executive committee of the State Temperance Society, avowed its determination to exclude wine from the communion table. But, as was foreseen by the thoughtful and reflecting, the warfare upon the temperate drinkers, the crusade against sacramental wine, and the cry for prohibitory liquor laws came either to an ignominious end, or are but feebly and spasmodically urged. All these extreme measures were carried forward at the expense of real temperance.

The zeal, persistence, and expenditure which has been devoted to the extreme and impossible, if practically and wisely directed, would have immensely mitigated the evils and averted the miseries of intemperance. But meanwhile intemperance is making hearts and households sad and desolate, so much so as to provoke

a movement by the women of our country, alike spontaneous, magnetic, and extraordinary.

Of that movement, emanating from the highest and purest sympathies and emotions of the human heart, he says, that he can neither think nor speak but with profound and intense respect and admiration. It is a movement of those who are happily described as "Heaven's last best gift to man"—a movement in defense of their children, and with the hope of reclaiming their husbands, their fathers, and their brothers. It was nobly conceived, has been courageously prosecuted, and he would rejoice to see it crowned with success. Nor can he bring himself to utter a syllable calculated to embarrass or discourage the generous women who are endeavoring to rescue their homes and their hearths from the blight of intemperance."

A question of such momentous consequences to our country, imperatively demands an investigation by the general Government, and it is encouraging to know that a movement has been made in that direction by eminent and influential friends of the cause.

We should have a committee appointed by Congress composed of men of known ability and unquestionable integrity, whose duty it should be to thoroughly investigate the adulterations of liquors and wines in our own and other countries, and make a full and correct report of the financial effects of the liquor traffic, and the

amount of pauperism, crime, disease and death caused by the indiscriminate use of alcoholic beverages. Such a report having the official endorsement of Government, and scattered broadcast among the people, would have great weight with them, and would materially aid them in acquiring a correct knowledge of this subject.

Experience has proved, that making the question a political one before the people are sufficiently instructed and prepared for it, has not checked the consumption of intoxicating liquors, for statistics show that the quantity consumed is steadily increasing.

If the people get an idea that any party or set of men are trying to dictate to them what they shall eat or drink, they will be disposed to consider it an interference with their rights, and act in opposition to them, and the prohibitory liquor law becomes a dead letter on the Statute book. But if they understand, and are kindly taught the scientific truth with regard to the effects of alcoholic drinks and their *universal and dangerous adulterations*, a law will as naturally be enacted to restrict and regulate their sale, as has been done in regard to the sale of prussic acid, arsenic or opium ; and the constitutional right and the necessity to enact such laws, will no more be questioned than the right and duty of our law-makers to protect the public health by wise and wholesome quarantine laws ; and a prohibitory law would be enforced as faithfully and rigorously

as the quarantine laws are now, for the people would know that a prohibitory liquor-law was more important for the protection of health and life than all the quarantine laws we have ever had in this country, and the sale of alcoholic liquors would, by common consent, be confined to respectable licensed druggists for use in the arts, for chemical purposes, and as medicines..

There has been no time since the temperance movement commenced, that the prospect of final success has been as encouraging as it is at present. The people are receiving correct instruction on the subject. The most eminent chemists and physicians of our own and other countries have, after thorough investigation, decided that alcohol belongs to the class of narcotico-acrid poisons, and defined its true nature and characteristics so clearly, that no man can engage in its manufacture or sale to be used as a common beverage, without sinning against light and knowledge.

The great advance in the temperance literature of the day is as able and brilliant as it is gratifying. The publications of the National Temperance Society and Publication House are steadily improving and increasing. "Bacchus Dethroned," by Powell, the "Basis of the Temperance Reform," by Burns, and some other publications by this house, are equal in point of ability to any publications on any subject that have emanated from any press for years. The crusade, as it is called,

by the women of our country is significant and extraordinary, and instead of being sneeringly called a crusade by "strong minded women," it should be called a movement by *sincere women* who have the faith to persevere and the courage to attempt to rescue their fathers, husbands, brothers and children, from shame, ruin and death.

Men of science are constantly enlightening the public through the leading scientific publications of the day in regard to the nature and effects of alcohol. And our gifted sons and daughters of song are giving us poetry that while it conveys the truth, may well be compared in beauty to the bacchanalian songs of Anacreon, Moore, Burns, and others. As a specimen I quote the following verses written by a young lady whose father, beginning as a temperate drinker, has fallen by insensible degrees, as so frequently happens, to become a drunkard, and consequently, reduced from affluence and respectability to poverty, misery and vice. His daughter only recites in burning words what thousands upon thousands of others have felt, who were similarly conditioned, but who had not the power of language to express the anguish of their souls.

## GO FEEL WHAT I HAVE FELT.

(By a young lady who was told that she was a monomaniac in her hatred of alcoholic liquors.)

Go, feel what I have felt,  
Go, bear what I have borne ;  
Sink 'neath a blow a father dealt,  
And the cold, proud world's scorn.  
Thus struggle on from year to year,  
Thy sole relief the scalding tear.

Go, weep as I have wept  
O'er a loved father's fall ;  
See every cherished promise swept,  
Youth's sweetness turn to gall ;  
Hope's faded flowers strewed all the way  
That led me up to woman's day.

Go, kneel as I have knelt ;  
Implore, beseech, and pray,  
Strive the besotted heart to melt,  
The downward course to stay ;  
Be cast with bitter curse aside—  
Thy prayers burlesqued, thy tears defied.

Go, stand where I have stood,  
And see the strong man bow ;  
With gnashing teeth, lips bathed in blood,  
And cold and livid brow ;  
Go, catch his wandering glance, and see  
There mirrored his soul's misery.

Go, hear what I have heard—  
The sobs of sad despair,

As memory's feeling fount hath stirred,  
And its revealings there  
Have told him what he might have been,  
Had he the drunkard's fate foreseen.

Go to my mother's side,  
And her crushed spirit cheer ;  
Thine own deep anguish hide,  
Wipe from her cheek the tear.  
Mark her dimmed eye, her furrowed brow,  
The gray that streaks her dark hair now,  
The toil-worn frame, the trembling limb,  
And trace the ruin back to him  
Whose plighted faith, in early youth,  
Promised eternal love and truth,  
But who, forsworn, hath yielded up  
This promise to the deadly cup,  
And led her down from love and light,  
From all that made her pathway bright,  
And chained her there 'mid want and strife,  
That lowly thing—a drunkard's wife !  
And stamped on childhood's brow, so mild,  
That withering blight—"a drunkard's child !"

Go, hear and see and feel and know  
All that my soul hath felt and known  
Then look within the wine-cup's glow ;  
See if its brightness can atone ;  
Think if its flavor you would try,  
If all proclaimed—"*Tis drink and die.*"

Tell me I hate the bowl—  
Hate is a feeble word :

I loathe, abhor, my very soul  
By strong disgust is stirred  
Whene'er I see, or hear, or tell  
Of the DARK BEVERAGE OF HELL !

And the following verses by the gifted young poetess,  
MISS SARA GENEVRA CHAFA, taken from a beautiful little  
volume entitled "Napoleon, and other Poems."

THE ROSY WINE CUP.

O, touch not the rosy wine cup,  
Though its brilliance should charm thine eye,  
For he who shall drink its contents  
Has opened a way to die.  
Not die as the *world* might call it,  
But die to the good and true,  
And blunt all the fine perceptions,  
That ever ennobled you.

There is power in the rosy wine cup  
To send through the heart and brain  
Bewildering thrills of pleasure,  
Dispelling the bosom's pain.  
But 'twill only return more sharply  
When the fire of the wine has passed,  
For the dreams it may awaken  
Are only too bright to last.

O, trust not your power of keeping  
Yourself from the shoals before !

Your strength, in an evil moment,  
May leave you forever more ;  
For the wine has conquered millions,  
And the loftiest minds of earth,  
Have sunk to the lowest level  
From a glass in an hour of mirth.

There are desolate homes where the demon  
Of drink has destroyed the light,  
There are hearts that have loved too fondly  
And bowed 'neath the wine cup's blight ;  
Put aside, then, the sparkling poison,  
For though danger seems far away,  
You will bless, in some happy future,  
The dawn of your Temperance day.

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Note to page 44.

These eminent men do not agree in every respect with regard  
what becomes of alcohol after it has been taken into the system  
but they all agree in deciding *that it is a Narcotico-Acid poison.*

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